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**Matrices and Determinoids.** By C. E. CULLIS. Cambridge: The University Press. G. P. Putnam's Sons American representatives. Pp. 430. \$7.00 net.

The chief feature of this book is that it deals with rectangular matrices and determinoids as distinguished from square matrices and determinants, the determinoid of a rectangular matrix being related to it just as a determinant is related to a square matrix. The author endeavors to set forth a complete theory of these two subjects, and uses the first volume to give the most fundamental portions of the theory. Two more volumes are promised, the second to give the more advanced portions of the theory, and the third its applications.

This is new ground and the author has done a splendid piece of work and with the publishers deserves much credit.

There is just one criticism which we wish to make and that is no reference is made to work already done. In a book of this kind where the ground is mostly new references cannot be numerous, but to a reader of the book references to the things that have been done before would be very valuable. For instance the work concerning the rank of a matrix is not all new and reference would be useful. Again the author's  $Q_m^n$  is the same as Metzler's  $\phi(n, m)$  in the *American Journal of Mathematics*, Vol. XXII., No. 1, and in "Netto Combinatorik," § 59.

**Nouvelles Tables de Logarithmes.** Par Emile Mougin. Published by the author. Roanne (Loire), 1913. 56 pages, with a large table for use in the class-room.

M. Mougin, professor of Mathematics in the Lycée de Roanne, has recently published this ingenious table of logarithms of numbers from 1 to 10,000, of the trigonometric functions from  $0^\lambda$  to  $100^\gamma$ , natural functions from  $0^\gamma$  to  $100^\gamma$ , and the natural and logarithmic functions from  $0^\circ$  to  $90^\circ$ . There is also included a very helpful conversion table. The centesimal table is arranged for tenths of the centesimal minute as well as for 60ths of the sexagesimal minute. The table shows the present tendency away from the old sexagesimal system and illustrates in a successful way the transition period through which we are passing.

Professor Mougin will send a copy of this table gratis to any professor of mathematics who may be disposed to make use of it in his class. The price prepaid is thirty cents.